INTERNATIONAL TECHNOLOGY CORPORATION

February 21, 1992

Mr. Robert M. Nelson, Jr.
Manager, Department of Energy
Rocky Flats Plant
Golden Colorado

ATTN: F.R. Lockhart

Dear Mr. Nelson:

At the request of Ms. Karen Schoendaller, I have prepared the following general discussion of the turnaround time required to analyze environmental samples for radiochemical parameters and provide final data package deliverables. As you will see the time to provide the final package is dependent upon the contractual requirements and the inherent limitations of radiochemical processing. While timeliness is a proper concern to both the client and the laboratory, the time required to perform the analysis with proper quality control and attention to accuracy, precision and detail will never be sacrificed at IT laboratories.

The EPA places radiochemical analyses in support of their programs in the Special Analytical Services (SAS) category. The amount of time allowed by the EPA to provide data packages for radiochemical analyses in the SAS category is 61 days (9 weeks). The normal turnaround time for radiochemical parameters, in IT laboratories, is six (6) weeks when only a certificate of analysis is required. This provides three (3) additional weeks for the preparation of data packages. Our review of the effort being expended in IT laboratories to prepare data package deliverables is consistent with the three weeks allowed by the EPA. Increases in TAT, beyond 61 days, are attributable to expanded requirements in the analytical and reporting processes.

The two key elements which determine the time required to provide results and documentation so that data packages can be prepared are the requirements of the contract and the limitations of the laboratory production process. Included in the limitations of the laboratory process are the time requirements for the analytical procedures and the constraints of the supporting instrumentation and computer software which controls the instruments. The laboratory process for specific analyses is further controlled by the contractual requirements for dissolution, yield requirements, low detection limits (which result in longer counting times), etc.

Regarding the area of laboratory limitations, the time required for analysis is determined by the procedures, available instrumentation and available manpower. This time is also determined by the necessity to properly perform analytical steps

and include the required levels of quality assurance and quality control. Some time is also necessary to add new samples into the production flow in a systematic manner. This allows IT laboratories to batch process samples and achieve efficiencies which are ultimately reflected in pricing.

Most radiochemical analysis procedures do not lend themselves readily to automation. Labor intensive, time consuming steps must be used to isolate the radionuclides of interest from the matrix.

Data packages compilation can not be started until the data is accessible. Impacting this time is the fact that counting room computer systems are generally designed for nuclear power plants and not for production laboratories. Data from the instruments often does not provide the result in the format required by the contract. Off-the-shelf instruments do not provide some of the criteria requested and therefore it must be produced with a manual operation. Raw data printouts are not routinely available as they are for chemical analyses. The raw data must often be generated as an additional step. There are few vendors supplying counting equipment. Those vendors have not yet responded to the needs to revise their systems and provide required protocols.

Our experience over the past two years indicates that many radiochemical data packages require up to thirteen weeks to provide the final data requirements. Some reasons for an additional four weeks of time are discussed below and include 1) analytical requirements, 2) data package content requirements, 3) specific calibration requirements and 4) the sequence of decisions which often require that additional analytical parameters (i.e., Ra-226 & Ra-228) be determined. Restrictions which prevent delivery of any partial data packages also determines the final schedule which IT can meet. Specific contractual limitations include:

•Some Minimum Detectable Activities (MDAs) for samples are extremely low. Extended counting times are required to meet these MDAs. Depending upon the number of detectors available long count times can significantly impact turnaround times. As an extreme example, assuming that only one detector is available an increase from 200 minutes (standard alpha spec count) to 2500 minutes could result in 10 samples taking over 3 weeks (17+ working days) to count rather than less than two days to count.

•An increased frequency for calibration of instruments and calibration checks which remove the instruments from production on a monthly basis.

•Partial data packages often are not allowed. Therefore any problem relating to a single sample in a batch will hold up the entire batch until the issue is resolved. This can include the need for reanalysis or the need to analyze for Ra-226 and Ra-228. The need to subsequently analyze for Ra-226 and Ra-228 and the need for reanalysis of a sample are not uncommon.

•In order to limit costs to clients, we are often directed to only analyze for Ra-226 after the results of the Gross Alpha and Gross Beta tests are complete and

the need for Ra-226 is apparent. Ra-228 analysis is not started until after the Ra-226 is complete, so we are in effect prevented from beginning a specific analysis until six weeks after sample receipt. The Ra-228 analysis takes two weeks to complete. In addition we hold Ra-226 analyses until we have a batch size which allows for a lower multiplier (batch discount) with a resultant lower cost to the client.

•If a rerun is required, it is not started until the gamma spectroscopy analysis is completed. The sample from the gamma spectroscopy analysis is needed to achieve sufficient sample volume for the rerun. This allows the client to keep sample volumes shipped to the laboratory to a minimum but it also impacts processing.

•Specific QC requirements for many contracts have become tighter. The relative percent difference is periodically made stricter.

•The analyses requested by clients who require data packages are usually those where IT capacity is limited due to the demand by all clients for these services.

•The client controls shipment of samples and therefore IT can't schedule work for the most opportune times.

•Environmental matrices are not homogeneous and therefore present challenges for any laboratory to process.

The lack of uniformity among clients, particularly DOE contractors limits the production capabilities of a laboratory. If all clients required the same detection levels, quality control efforts and data deliverables then the flow of work through a laboratory could move relatively smoothly. These differences often require extensive software modifications. Even after software modifications the current diversity of contractual requirements restricts efficiency. As programs progress and needed changes are identified, the modified requirements often become more complex and it takes even more time to provide a finished product.

The contents of a data package for each batch of samples must often include as a minimum, copies of instrument backgrounds, continuing calibration verification information, calculation sheets and raw data in addition to the hard copy final report. Other information such as copies of calibration data is normally supplied annually or when re-calibration has been performed. Many DOE data packages for each batch of samples must also include a detailed description of any abnormalities which occurred during sample analysis. Also included are copies of the raw data for blanks, laboratory control samples and replicate analyses. None of these are required for a normal certificate of analysis package.

As I stated at the beginning of this letter, timeliness is a primary concern at IT laboratories. We have reviewed many analytical operations to develop a system which we feel is efficient, considering the limiting factors mentioned above. We continue to review operations and we incorporate time-saving steps whenever

they can be justified. This justification will never be based upon steps which could reduce the quality of or confidence in the data we provide.

Thank you for you interest in IT. We appreciate the business we derive from Rocky Flats and the opportunity we have to demonstrate the quality analytical work we can routinely provide. If you have any questions regarding this issue, or if you would like to discuss it further please contact me at (509) 375-3131.

Sincerely,

Lance R. Waddell
Laboratory Director

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